CHAPTER 4
SELECTION AND IMPLEMENTATION OF THE LONG-TERM PLAN

This chapter recommends procedures for selecting, adopting, and implementing combined sewer overflow (CSO) controls under the long-term control plan (LTCP). The procedures include the role of public participation and agency interaction, selection and development of a recommended plan, adoption, financing, implementation scheduling, preparation of an operational plan, post-construction compliance monitoring, and re-evaluation and update of the LTCP.

4.1 PUBLIC PARTICIPATION AND AGENCY INTERACTION

After detailed evaluation, but prior to the selection of specific CSO controls under the LTCP, the public should be informed about each alternative. The detailed evaluation and ranking of alternatives is typically compiled in a draft report. Because long-term CSO abatement planning usually involves a significant amount of data collection and analysis, it is often prudent to summarize the results of the evaluation in an executive summary. Copies of the draft report should be distributed to the repositories established at the initiation of the public participation program. Control plan alternatives can include control alternatives involving both the construction of facilities and the adoption of new management practices. The extent to which each type of control measure is utilized within each alternative can be based on public input. The implementation schedule and method of financing can also be selected or modified based on public input.

Informing the public about potential alternatives is one part of the public participation process. The extent of the public participation program generally depends on the amount of resources available and the size of the municipality. Exhibit 4-1 presents component programs and their elements for a comprehensive public education and involvement process in Portland, Oregon.

Exhibit 4-1. Example of Public Participation Program for Portland, Oregon, CSO Management Program

Component Programs	Program Elements
River Alert Program	Placement of informational and warning signs Media advisories
Public Education	Media coverage Speaker's bureau *Clean River Review* newsletter *CSO Update* newsletter Direct mailers Billing inserts Videotape production Issue and choices booklet Educational theater presentations Interactive educational software
Public Involvement	Public meetings Creative Alternatives Workshop Clean River Funding task force Clean River committee Community leader interviews General public telephone survey Focus groups

Source: CH2MHILL, 1993

Typically, public meetings are the forum for describing and explaining alternatives. The municipality and its agents should discuss each alternative thoroughly. Technical solutions should be presented in a simple, concise manner, understandable to diverse groups. The discussion should include, to the greatest level of detail possible, background on the project, a description of proposed facilities, the level of control to be achieved, temporary and permanent impacts, possible mitigating measures, and cost and financial information. Graphics can be used to compare each alternative with regard to site layouts, resource requirements, and cost. The benefits of each alternative should be articulated clearly so that public support can be generated.

Public hearings are usually formal proceedings in which the agenda, including comments, questions, and responses, are recorded. One or more public hearings are generally held so that public interest groups, business and civic organizations, and members of the general public can officially comment and/or pose questions to the municipality. The municipality should consult

with local, State, and Federal regulatory agencies to identify any public participation requirements. In some cases, municipalities might consult the public participation conditions and program elements set forth in 40 CFR Part 25. These regulations provide for:

- Well-publicized notice of the hearing mailed to interested and affected parties at least 45 days prior to the date of the hearing
- Location and time of the hearing chosen to facilitate attendance by the public
- Presentations scheduled in advance to ensure maximum participation
- Conduct of the hearing in a manner that allows for informing the audience and soliciting information from the public
- Record of the hearing procedures prepared and made available by transcript or recording.

To improve communications at public meetings or hearings held during this phase, the municipality can summarize technical information that will be presented at meetings. The municipality should also generally designate an agent to attend the meetings, take notes, and distribute and collect public comment sheets so that participants' views are recorded. If the municipality has retained a consultant to prepare the plan, the consultant will typically present the findings and recommendations of the alternative evaluations. In larger municipalities, an experienced public participation consultant can be used as a facilitator or moderator. A number of public meetings (held prior to formal public hearings) might be necessary for larger municipalities; however, smaller municipalities should consider at least two meetings prior to a formal public hearing.

Presentations to the public should explain the benefits of CSO control. For example, improvements in water quality can significantly improve aesthetics, recreational areas, opportunities for increased use of beaches, or fishing and shellfishing. These benefits might offset construction, environmental, and financial impacts associated with each alternative and, therefore, should be communicated in order to reach a consensus. A key objective of the public education process is to build support for increases in user charges and taxes that might be

required to finance CSO control projects. By demonstrating the importance of improved water quality and the cost-effectiveness of proposed control alternatives, rate payers and taxpayers will be assured that environmental protection is being provided at the lowest reasonable cost.

In order to proceed with adoption of an LTCP, the regulatory community should be part of the consensus. Presumably, Federal, State, county, and other regulatory groups will have been involved throughout the long-term CSO control planning process. Early and consistent coordination with the regulatory authorities during the development and implementation of the LTCP and WQS review provides "*...greater assurance that the long-term control plan selected and the limits and requirements included in the NPDES permit will be sufficient to meet WQS and to comply with Sections 301(b)(1)(C) and 402(a)(2) of the CWA*" (III.A). Typically, the municipality submits to the regulatory authority technical memoranda, interim reports, minutes of public meetings, and responsiveness summaries. The regulatory agencies then submit their comments to the municipality. The municipality is responsible for responding to each agency.

4.2 FINAL SELECTION AND DEVELOPMENT OF RECOMMENDED PLAN

After appropriate public input (e.g., one or more public hearings) and receipt of comments from interested parties, the municipality should proceed to selecting and adopting an LTCP. If the public information program has been strong and continual during the course of the planning effort, the highest-ranked alternative from the alternatives evaluation will probably be adopted. If a consensus to select a different alternative has developed as a result of the final public meetings, public hearings, and comments, however, a different option might be selected. The responsible legal entity takes action to select and officially adopt the LTCP. For example, a large metropolitan water management authority would adopt the plan by a vote of its board of directors. Cities might require a vote by the city council or, in smaller communities, its counterpart.

In some cases, multiple agencies or jurisdictions might have to adopt the plan. If more than one entity is responsible, intermunicipal agreements might be necessary. The final

published plan should incorporate adopted resolutions of plan acceptance and proposed or executed intermunicipal agreements.

The municipality should develop the LTCP to enable implementation by the CSO program team. The information obtained through the earlier tasks of assessing existing baseline conditions and alternatives evaluation can be used as a basis for fully developing the selected plan.

The first part of the LTCP should describe the controls selected for implementation. This includes both management and operational controls, as well as controls that require constructed facilities. For controls that do not include the construction of facilities, the selected plan should identify the frequency of conducting each practice, where the practice takes place, a schedule of activities, the necessary staffing, and the cost. Initial program start-up costs can include training staff and purchasing equipment. Ongoing costs typically include labor for maintenance efforts. A record system should also be designed to track activities and pertinent data.

Controls that require constructed facilities eventually necessitate engineering design and construction. At this stage of plan development, the LTCP should include a description and diagrams, concept sketches, or architectural renderings of each facility. Design information, including assumptions and design criteria, should be tabulated. Site-specific information such as known site conditions, including existing structures, topography, and use, as well as soil conditions, utility locations, and wetlands and other resource areas, should be documented. Final detailed design plans and specifications should be prepared in accordance with the implementation schedule.

For each selected control, the municipality should develop a cost estimate. Although the cost is initially estimated during the alternatives development step, it can be refined for the implementation plan. Accuracy is important because the cost estimates might provide a basis for fund allocation. Project cost estimates should include costs for engineering, construction, site acquisition, and legal and financing fees. Because uncertainty still exists at this stage (site survey and engineering work is still normally necessary), contingencies should be included in

the estimate, and a range of values might be appropriate. Operation and maintenance (O&M) costs can also be refined at this stage to assess the impact on user fees or tax rates. Cost estimates can be tied to an applicable cost index, such as the ENR/CCI for construction costs or the PPI (Producer Price Index) and the CPI (Consumer Price Index) for O&M costs. Using these indices, costs can be adjusted in the future to account for inflation.

Because proper O&M is particularly important to the long-term functioning of constructed controls, it is necessary to ensure that maintenance requirements are included in the selected plan. Specifically, the implementation plan can identify the number of and time period that additional staff might be needed or reassigned. A more detailed review of resource inputs, such as chemical deliveries, can be included.

4.3 FINANCING PLAN

The key element for implementation of an LTCP is the ability to obtain funding for the selected controls. Most LTCPs include construction of abatement facilities. For some municipalities, the LTCP includes relatively costly, capital-intensive projects, such as deep tunnel storage. Chapter 3 describes the importance of cost-effectiveness in alternatives selection. The financial capability of the municipality is a major factor in determining the implementation schedule. The financing method is also important. The CSO Control Policy states that each municipality "*...is ultimately responsible for aggressively pursuing financial arrangements*" (I.E) for implementation. For this reason, some municipalities might engage a financial consultant familiar with municipal finance as part of the planning and/or implementation team. The municipality should review and select both a capital funding approach and a method of collecting annual funding needs.

4.3.1 Capital Funding Options

Capital funding options include bonds, loans, grants, and privatization (EPA, 1995f).

4.3.1.1 Bonds

Bonds are promissory notes issued (sold) by local governments to raise funds to pay for projects that require a large amount of capital. A bond has a fixed payment schedule that is often 20 years for municipal or local utility bonds. Revenue bonds, sometimes referred to as water/sewer bonds, are generally backed by user fees or service charges paid by system users. General obligation (GO) bonds are issued by a municipal or county government to fund capital projects of the jurisdiction. GO bonds are secured by the general taxing power of the local jurisdiction. GO bonds are viewed as the most secure type of local debt. Many municipalities require voter approval to issue these bonds. Statutory limits can apply to the amount of GO debt.

4.3.1.2 Loans

Loans from private, State, and Federal sources can be used to finance CSO control projects. The loan interest rates vary, depending on the program. The ability of a municipality to secure a loan depends, in part, on its "creditworthiness," or ability to repay the funds borrowed. Loans are available from a variety of sources, including State Revolving Fund (SRF) programs, other State loan programs, the Rural Development Administration, CoBank (the National Bank of Cooperatives), and commercial lending institutions. Each source has different requirements, advantages, and limitations.

4.3.1.3 Grants

Many municipalities have experience with wastewater construction grants. Grants are expected to play only a limited role in future CSO program funding, however. Direct Federal grants have been replaced with SRFs and other local funding options. Individual States might have different SRF program elements. For example, some might include partial grants and subsidized loans, while others have only subsidized loans. EPA offers a variety of State and local grants for program research and development, administration, demonstration, and planning. These grants can provide funding for CSO-related activities indirectly. The availability of grant funds usually varies annually, reflecting congressional mandates and EPA policies. Also, for small and economically disadvantaged communities, the Rural Development Administration

offers up to 75-percent grants for the construction of environmental infrastructure facilities. The Economic Development Administration (EDA), U.S. Department of Commerce, also awards grants to economically disadvantaged communities for construction of public works.

4.3.1.4 Privatization

Private investment in wastewater treatment facilities can provide an additional option for funding CSO facilities. In response to a recent Executive Order, EPA is developing policy and regulatory changes to encourage private investment in EPA-funded municipal wastewater treatment facilities. The final outcome of these changes is unknown at this time, but for some municipalities, privatization might be a viable option.

4.3.1.5 Other Capital Funding Options

Other options include special reserves, special assessments, and "pay-as-you-go." Special reserves are usually funds established by municipalities to fund capital equipment repair or replacement. In some cases, these reserves can be used to fund CSO controls. Special assessments are used to provide and fund projects for a specific geographical area. Special assessment districts provide the legal arrangement to charge those receiving the service for the capital and/or operating cost of the project. For smaller, less expensive projects that are more common to smaller municipalities, a "pay-as-you-go" approach can be used where projects are funded with annual tax and other revenues.

4.3.2 Annual Funding Options

Annual CSO costs include:

- O&M costs for CSO controls
- Annual loan payments for SRF or other loans used to fund CSO controls
- Debt service on local bonds used to fund CSO controls
- Reserves for future equipment replacement.

Annual funding options include different types of fees and taxes. Both the Federal construction grant program and the SRF program require sewer user fee systems. Federal law requires such systems only on SRF loans and aid from the Federal Government to the SRF. Loans made from State funds in the SRF do not require user fee systems except pursuant to State law. User fees are widely accepted as an equitable source of revenues for water pollution control. Some municipalities have implemented storm water utilities that assess user fees based on impervious area or runoff. In general, sales, property, or income taxes cannot be used to pay annual operating costs of projects funded under EPA construction grant funding or SRF funding but can be used to repay bonds used for capital outlays. A number of communities use an ad valorem (i.e., general property) tax levy to collect operating costs. These exceptions require EPA approval.

4.3.3 Selection of Financing Method

The method of financing will be determined by several factors, including:

- The availability of each option. For example, some municipalities might have difficulty in obtaining long-term bond financing. Some States might have applicable grant or loan assistance programs, while other States might not.
- The advantages and limitations of a specific type of financing.

The LTCP should identify a specific capital and annual cost funding approach. EPA's guidance on funding options presents a detailed description of financing options and their benefits and limitations, as well as case studies sharing different approaches municipalities took to fund CSO control projects (EPA, 1995f). Most municipalities will continue to depend on local revenue bonds or SRF loans for capital to fund CSO controls. Annual costs will most likely be paid for by user fees.

4.4 IMPLEMENTATION SCHEDULE

A common characteristic of an LTCP is that CSO controls will be implemented over a long time period. The municipality is expected to consider a number of factors in preparing a

schedule of activities. According to the CSO Control Policy, the nine minimum controls (NMC) should be implemented prior to adoption of the LTCP.

The CSO Control Policy recommends a phased implementation schedule based on the relative importance of adverse impacts upon water quality standards (WQS) and designated uses. The municipality is expected to consider eliminating overflows that discharge to sensitive areas and cause use impairment.

In addition, the CSO Policy recommends consideration of financial capability in developing the implementation schedule. As described in Section 3.5, the financial capability assessment should include an evaluation of the following:

- Median household income
- Total annual wastewater and CSO control costs per household as a percent of median household income
- Overall net debt as a percent of full market property value
- Property tax revenues as a percent of full market property value
- Property tax collection rate
- Unemployment
- Bond rating.

In addition to financial capability, the CSO Control Policy recommends that the municipality consider sources of funding in determining the phasing of construction projects. The municipality can consider the availability of grants and loans; previous and current residential, commercial, and industrial sewer user fees and rate structures; and other viable funding mechanisms.

Other considerations include the need for pilot-scale testing, time necessary for obtaining necessary permits, and the need to observe timing constraints for obtaining funding (e.g., SRF

grant/loan application deadlines, local referenda). These considerations are incorporated into a schedule with start and finish dates for major tasks and milestones. The schedule should also include interim dates for reporting CSO control results and monitoring program results.

Depending on the size of the LTCP, the schedule could be shown by means of a simple bar chart or a more complex Critical Path Method (CPM) system using project scheduling/ management computer software. The decision on the type of schedule to develop should be determined by the level of program complexity. This can be assessed by the number of tasks and subtasks (activities) required, the number of entities involved, the length of time over which the LTCP will extend, and the available management resources. Tasks associated with financing should be included in the implementation schedule.

Implicit in developing an implementation schedule is the need to set priorities. The CSO program team should review the recommended CSO controls and determine an order of implementation (or phasing), taking into account extenuating circumstances in any particular case. If funding is a major issue, for example, the least expensive controls can be implemented early in the process. Individual projects should be phased in accordance with available funding. In general, priorities and, thus, the schedule of program implementation, should be tailored to each situation.

If the development of public support for the LTCP is a critical issue, the CSO program team should consider addressing first any control with the potential for significant pollution reduction. In this case, controls that could improve the water quality of widely used water bodies should be implemented, if possible, before other steps are taken. These decisions should be reflected in the implementation schedule.

Exhibit 4-2 provides an example of a phased implementation. After implementation of the NMC and development of the LTCP, this particular municipality will proceed with six construction projects. The first three construction contracts—contracts 1, 2, and 3—will address sensitive areas by protecting a designated National Marine Sanctuary, eliminating beach closings, preventing fish kills, and opening shellfish beds. They will address overflows that include

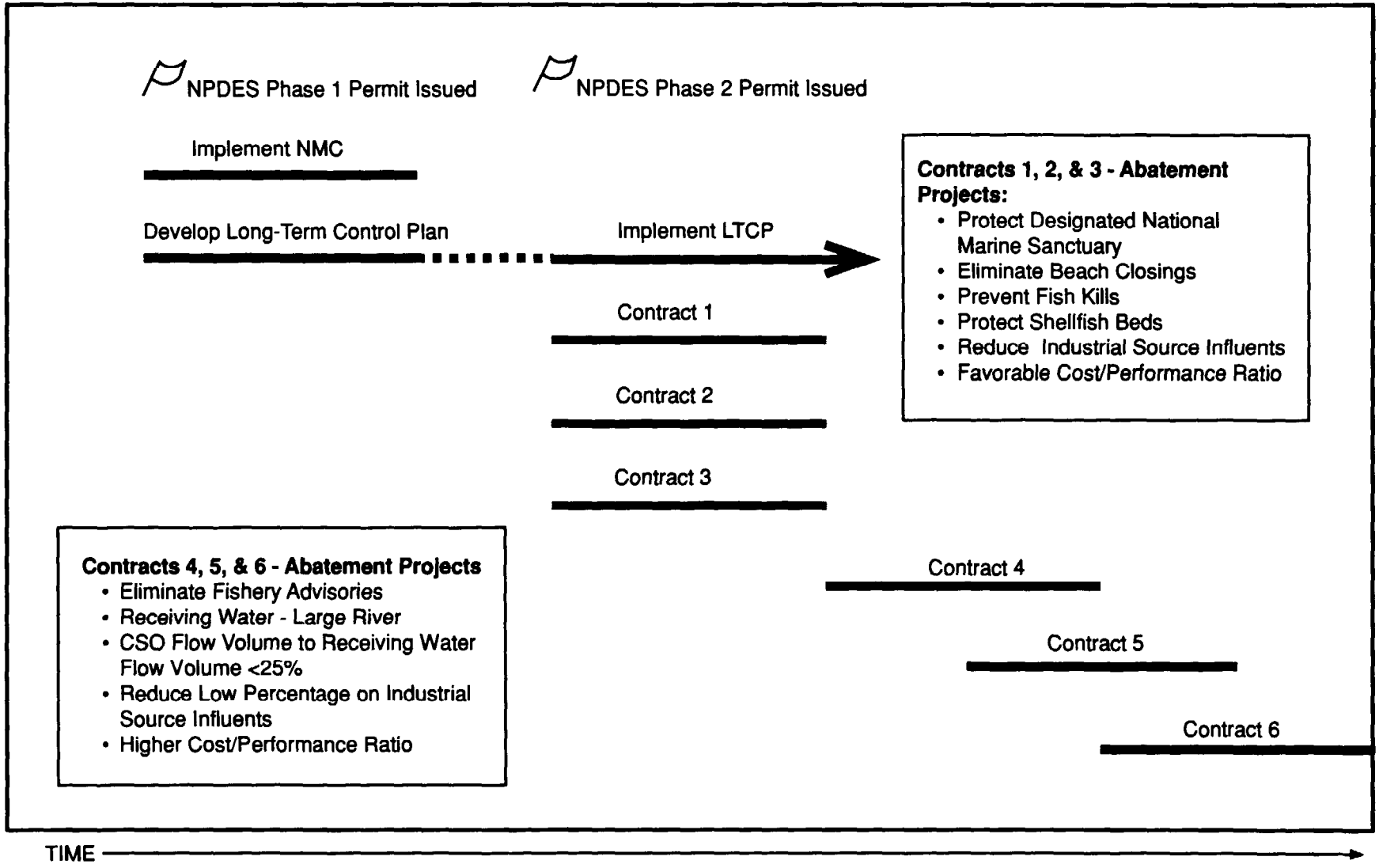

Exhibit 4-2. Example of Phased Implementation Approach

significant discharges from industrial sources with potentially toxic materials. The projects also have favorable cost/performance ratios, and the financial impact on the municipality will not be excessive. The subsequent three projects, Contracts 4 through 6, address overflows to a less sensitive area, a large river. They have a relatively low flow volume compared to the flow of the receiving water and have little influent contributed by industrial sources. Their cost/ performance ratio is not as favorable as the initial three projects. As shown on the schedule, the three contracts are staggered to allow for funding availability in successive years.

It is important that the individuals and entities responsible for implementing each aspect of the program be identified in the LTCP. Much of the effort for implementing plans should come from either local or regional governments. At the State and Federal levels, enforcement and oversight probably will occur, and technical and financial assistance might be available. To develop a plan, municipal officials should coordinate and initiate activities, as well as motivate others in the municipality or other agencies to get involved. Firm commitments from these agencies prior to program implementation is important to the final success of the program. Exhibit 4-3 identifies groups, agencies, and individuals that can support aspects of the management plan, including monitoring, design, permitting, regulations, public education, maintenance, and enforcement.

4.5 OPERATIONAL PLAN

As part of the implementation of the NMC, municipalities should be required to develop and document programs for operating and maintaining the components of their CSSs. Once an LTCP has been approved, however, the municipality's O&M program should be modified to incorporate the facilities and operating strategies associated with the LTCP controls.

Typically, each facility constructed as part of the LTCP will have its own O&M manual detailing the equipment and features of the facility, including operating instructions, troubleshooting guides, and safety considerations. If the LTCP features multiple facilities, however, a master operating strategy should be developed to optimize the operation of the various LTCP components. Optimization might involve coordination of pump back timing,

Exhibit 4-3. Potential Implementation Responsibilities

Program Component	Responsible Organization	Other Potentially Involved Parties
Monitoring	Local Water Pollution Control Agency Local Boards of Health State Water Pollution Control Agency State Marine Fisheries Department	Local Environmental Groups University Students Volunteer Organizations Environmental Consultants
Engineering Design	Local Water Pollution Control Agency Local Engineering Department State Department of Public Works	University Engineering Departments Engineering Consultants
Permitting and Regulatory Controls	Local Water Pollution Control Agency Local Boards of Health Local Conservation Office Local Planning Board EPA State Water Resources Agency Federal Coastal Zone Management Office U.S. Army Corps of Engineers	Local Environmental Groups Environmental Consultants
Public Education	Local Water Pollution Control Agency Regional Environmental Agency Local Environmental Groups Watershed Associations State Environmental Agency EPA	Local Environmental Groups Local Civic Groups Private Organizations Cable TV/Newspapers Public Participation Consultants
Maintenance	Local Water Pollution Control Agency Local Department of Public Works	Contract Maintenance Providers
Enforcement	Local Conservation Agency Local Board of Health Planning Board Local Code Enforcement Officer Coastal Zone Management U.S. Army Corps of Engineers State Environmental Agency EPA	Local Environmental (watchdog) Groups

dynamic regulator operation, or other real-time operating strategies. Interim operating strategies might be required for phased projects and for construction-period operations and flow transitions. Maintenance programs should consider the unique operating conditions of CSO facilities, particularly with regard to schedules for inspecting and exercising idle equipment. Aspects of

the post-construction monitoring program might also be incorporated into the operational plan, as regular schedules for sampling and maintaining sampling equipment are developed.

If not addressed in the individual facility O&M manuals, the operational plan should identify staffing needs for CSO control facilities, both in terms of numbers of staff and specific positions necessary, with appropriate descriptions of responsibilities and minimum qualifications.

4.6 POST-CONSTRUCTION COMPLIANCE MONITORING

The municipality should conduct a monitoring program during and after LTCP implementation to help determine the effectiveness of the overall program in meeting CWA requirements and achieving local water quality goals. Monitoring during LTCP implementation should include data collection to measure the overall effects of the program on water quality and to determine the effectiveness of CSO controls. Because existing water quality conditions should have been determined during the planning process, receiving water quality will probably be well understood before LTCP implementation. A monitoring plan to assess water quality conditions during and after program implementation will allow evaluation of the improvements through comparison to baseline conditions.

Sampling data can also be used to educate the public on the effects of CSOs on receiving water quality and the need for CSO control. To increase public awareness, information that identifies the effects of CSO abatement can be disseminated in newsletters, at public meetings, or by other means. Trend analyses are helpful in understanding the changes in receiving water quality and can provide important feedback to assessments of the success of CSO controls. Long-term data can be used to demonstrate the influence of control plan activities on water quality.

Overall plan effectiveness can usually be determined more easily than the effectiveness of individual controls. The long-term monitoring plan should be designed to measure effectiveness and provide accountability. The plan should use existing monitoring stations (both those used in previous studies and those used for collecting data during system characterization,

as outlined in Chapter 2) to collect long-term data for comparisons. Using this approach, program progress in addressing pollution problems and preventing further water quality degradation can be determined. Monitoring plan components (e.g., a map of monitoring stations, a record of the frequency of sampling at each station, a parameter list, a QA/QC project work plan) should be identified in a work plan similar to that outlined for sampling in Chapter 2.

Collecting sufficient data to clearly define the effectiveness of CSO controls is challenging sometimes for various reasons, including the variability of rainfall and CSOs and the difficulty in specifically identifying the effect of a particular control on a receiving water. This type of monitoring program should be developed with caution because of the importance associated with demonstrating the effectiveness of CSO controls on receiving water quality.

4.7 RE-EVALUATION AND UPDATE

The post-construction compliance monitoring program is intended to *"...verify compliance with water quality standards and protection of designated uses as well as to ascertain the effectiveness of CSO controls"* (II.C.9). The CSO Control Policy provides that *"...the selected controls should be designed to allow cost effective expansion or cost effective retrofitting if additional controls are subsequently determined to be necessary to meet WQS, including existing and designated uses"* (II.C). If the implemented controls do not result in attainment of WQS, including designated use, a municipality should evaluate the current system's operating practices before considering structural modifications. If correct operating practices are confirmed, the re-evaluation might indicate that a different operating strategy should be considered, such as bypassing flow at a different flow rate. In some cases, real-time control system operating software might have to be modified or weir elevations changed.

If post-construction compliance monitoring indicates that existing WQS are not being met, the data generated can be used to identify the additional CSO controls necessary to achieve WQS. This can include a repeat of the WQS review conducted earlier in the planning process. The CSO Control Policy provides that *"...if adequately supported with data and analyses,*

Agency regulations and guidance provide states with the flexibility to adapt their WQS, and implementation procedures to reflect site-specific conditions including those related to CSOs....In addition, the regulations...specify when and how a designated use may be modified" (III.B). In accordance with the CSO Control Policy, however, expansion or retrofitting of a CSO control facility might ultimately be required.